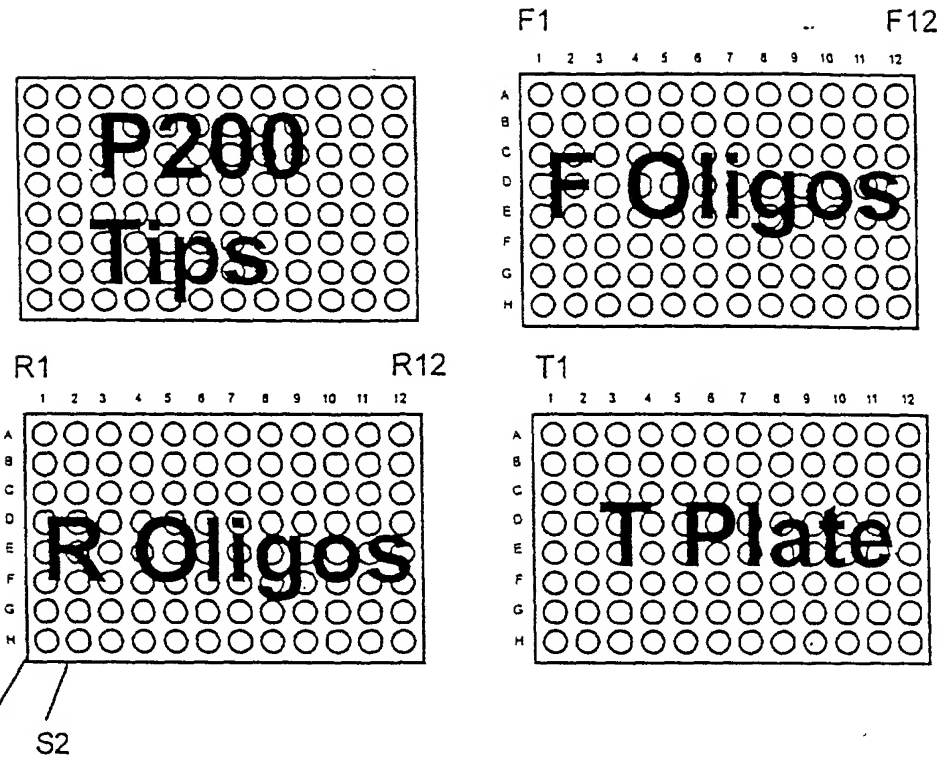


4

Biomek Set-up

Figure 1

Genewriter - Oligonucleotide Pooling Plan

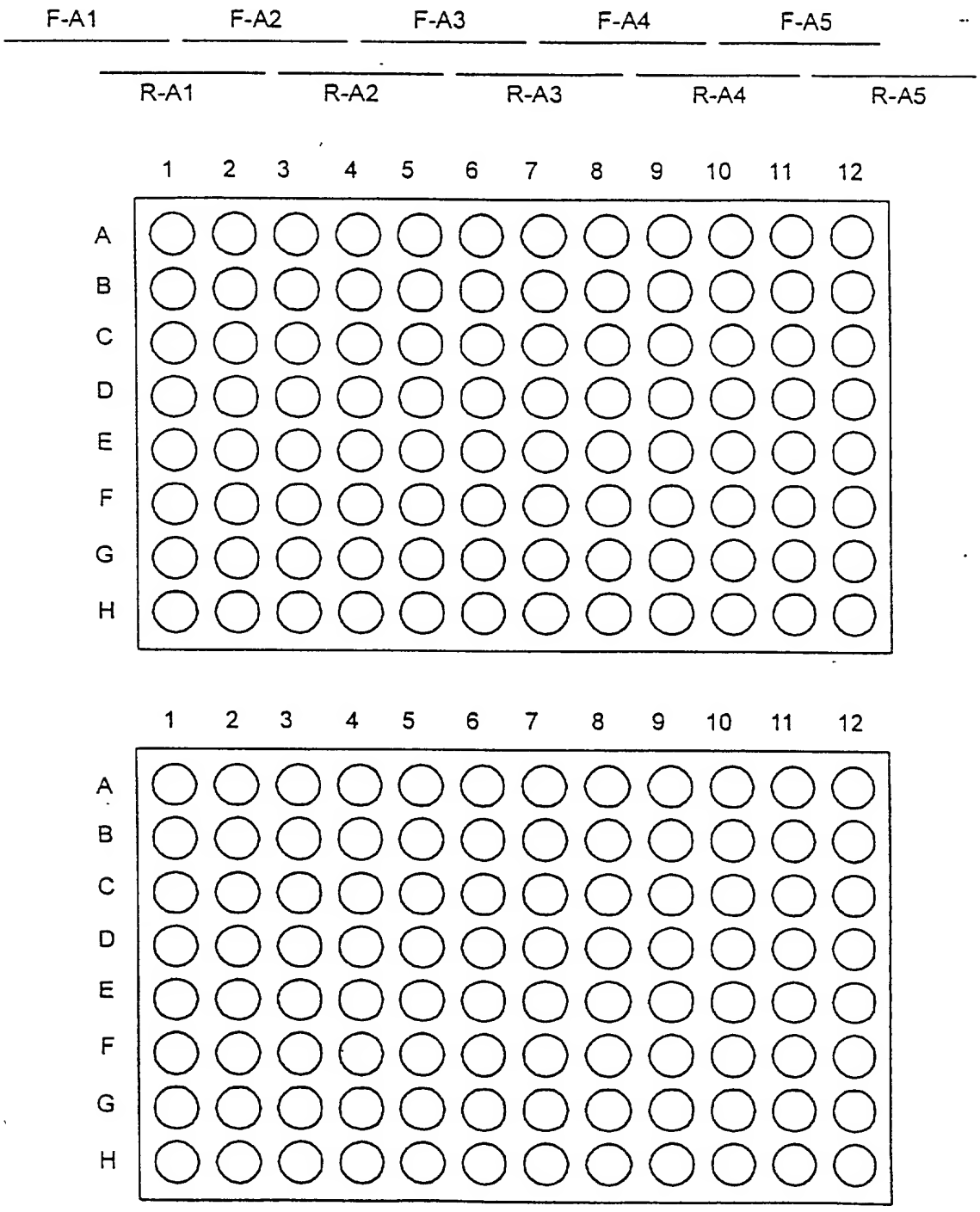


Figure 2

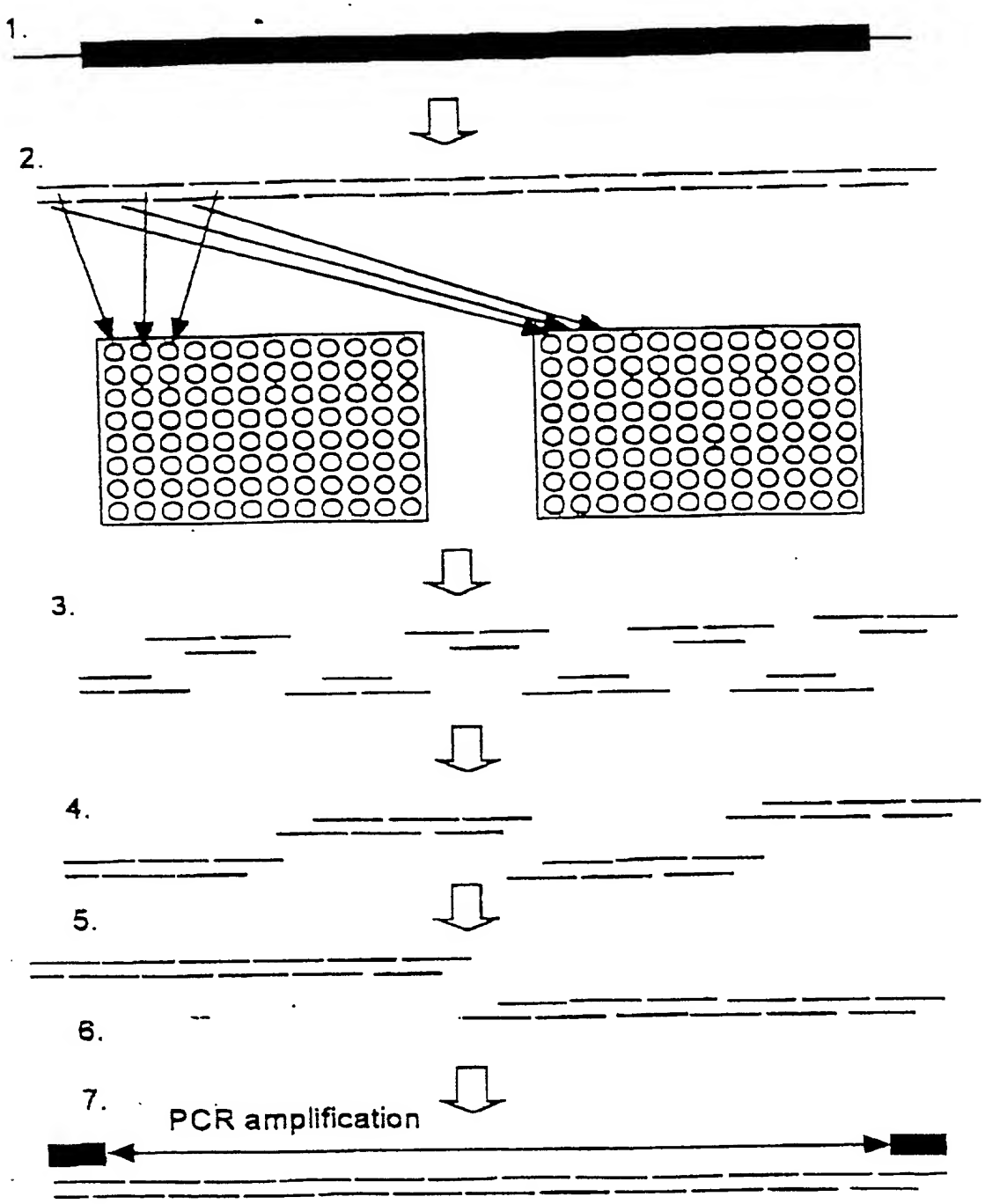


Figure 3

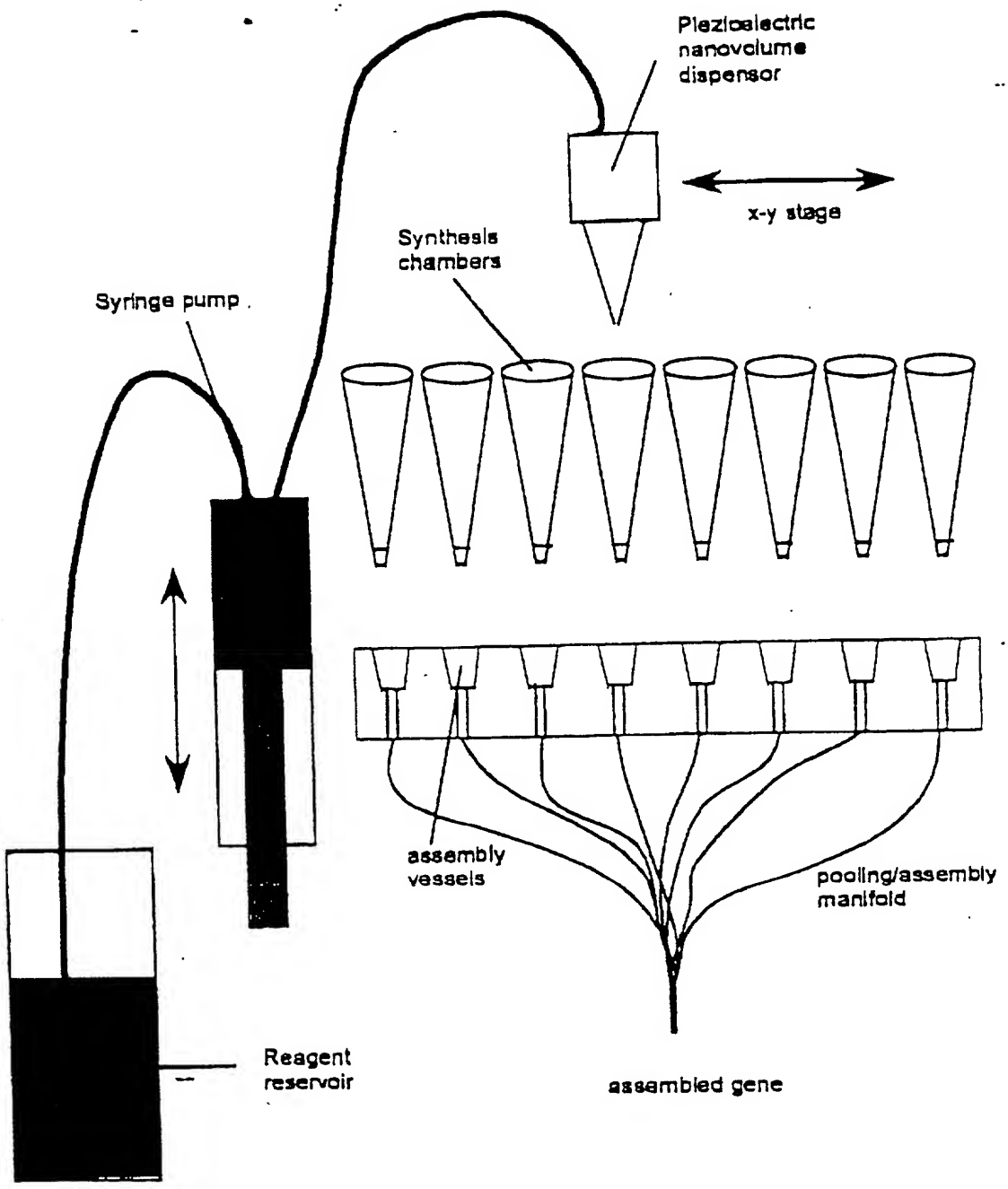

Piezoelectric
nanovolume
dispensor
x-y stage
Synthesis
chambers
Syringe pump
assembly
vessels
pooling/assembly
manifold
Reagent
reservoir
assembled gene

Figure 4

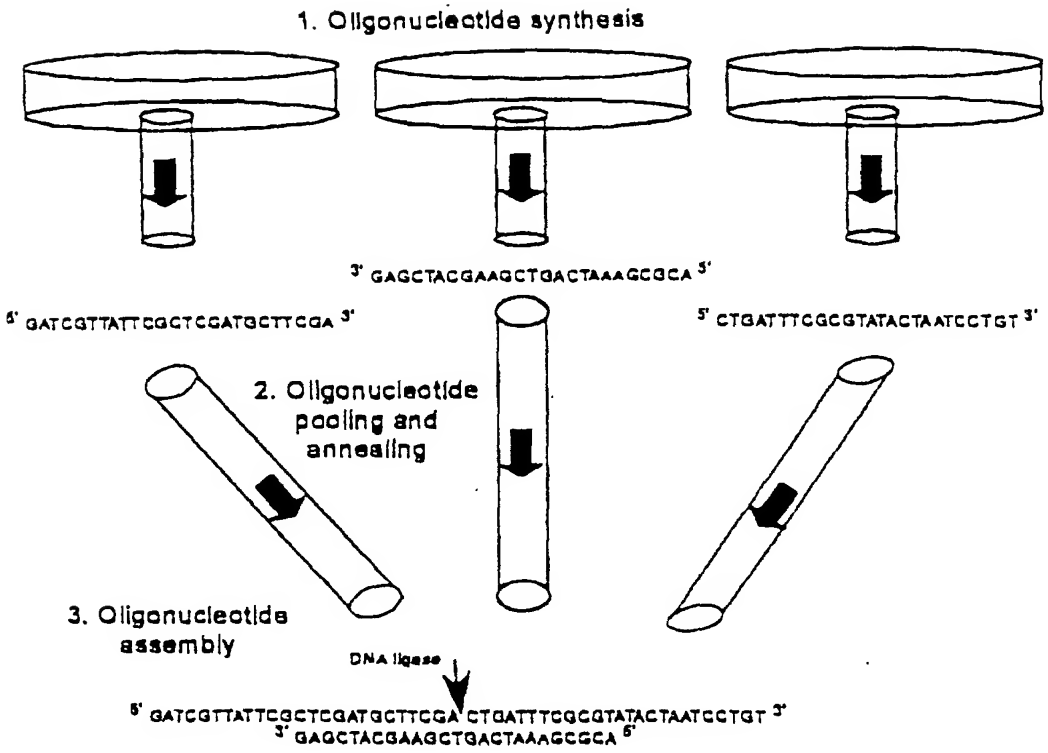

1. Oligonucleotide synthesis
3' GAGCTACGAAGCTGACTAAAGCGCA 5'
5' GATCGTTATTCGCTCGATGCTTCGA 3'
5' CTGATTTCGCGTATACTAATCCTGT 3'
2. Oligonucleotide pooling and annealing
3. Oligonucleotide assembly
DNA ligase
5' GATCGTTATTCGCTCGATGCTTCGA CTGATTTCGCGTATACTAATCCTGT 3'
3' GAGCTACGAAGCTGACTAAAGCGCA 5'

Figure 5

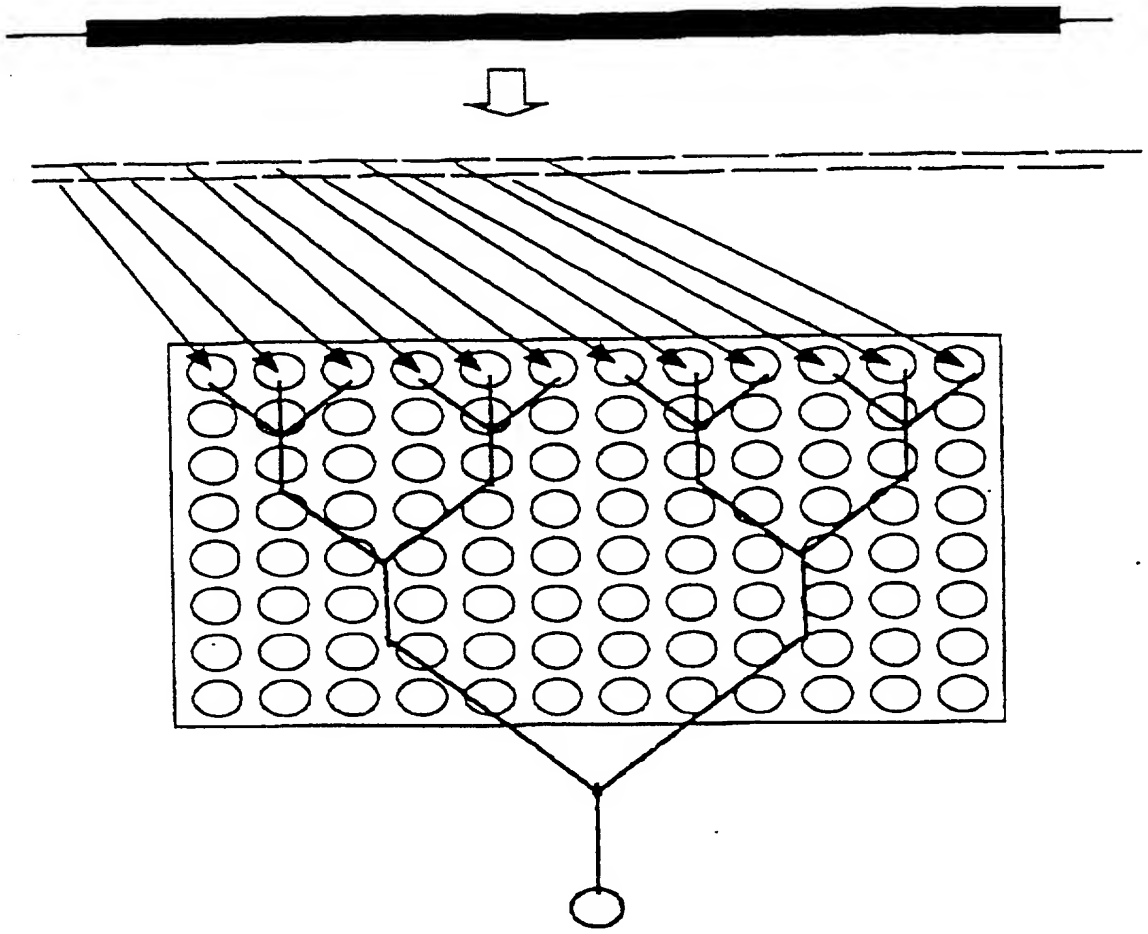


Figure 6

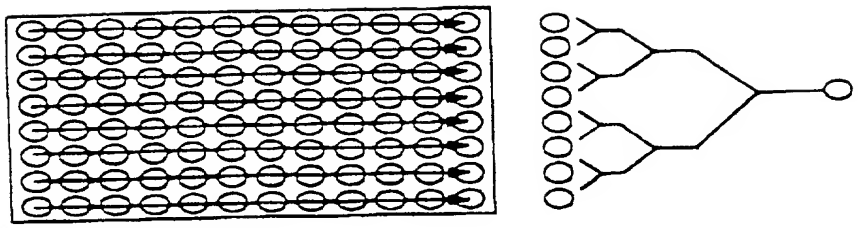


Figure 7

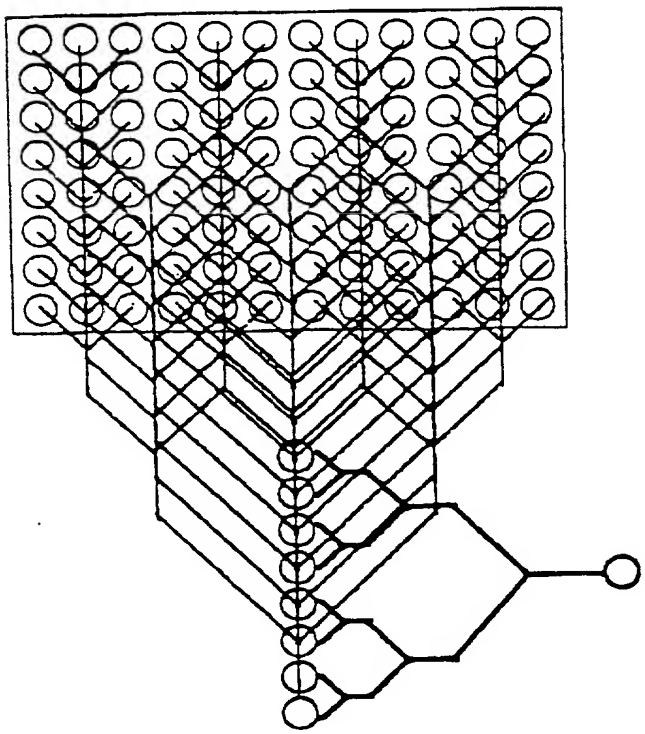


Figure 8

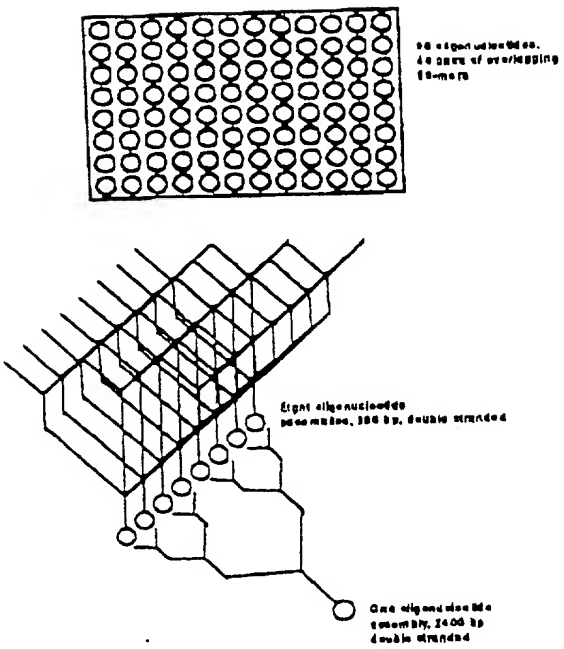


Figure 9

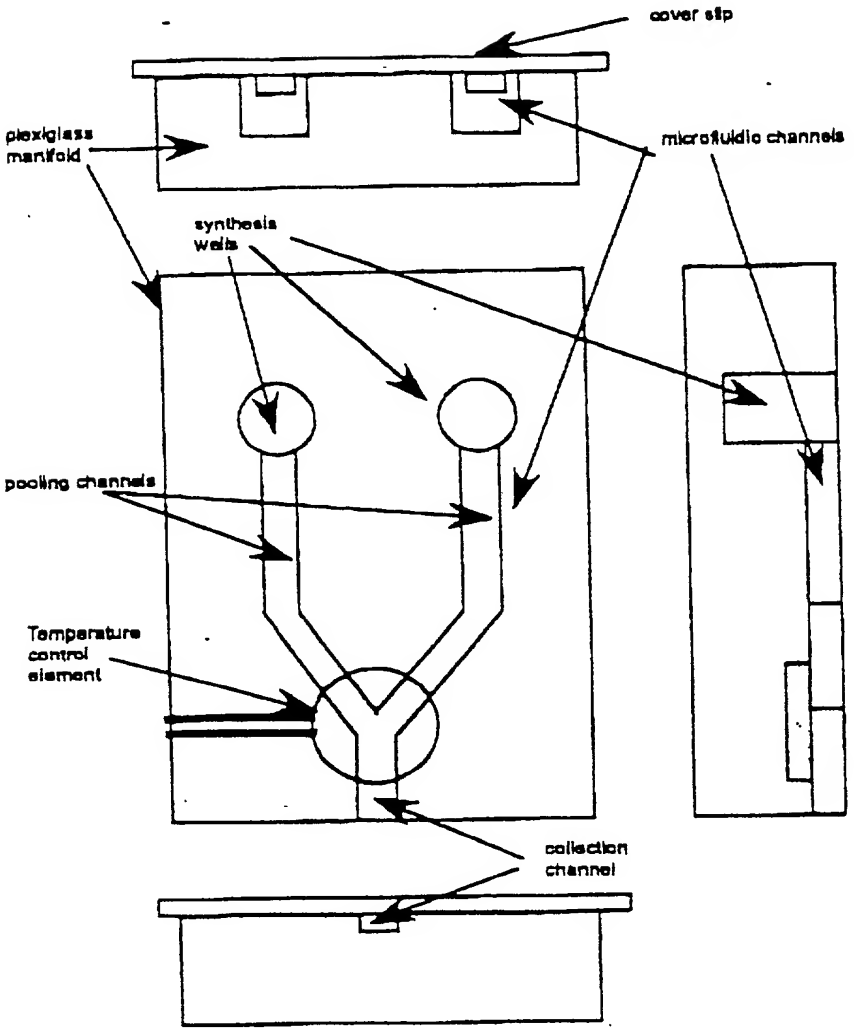

cover slip
plexiglass manifold
microfluidic channels
synthesis wells
pooling channels
Temperature control element
collection channel

Figure 10

Genewriter Platform Design
8 x 96 well plates addressed with 16 piezioelectric nanovolume dispense heads; One wash/dry station and one additional plate station. 8 plate evacuated by a single vacuum station.

Capacity of 8 x 96 = 768 oligos/run

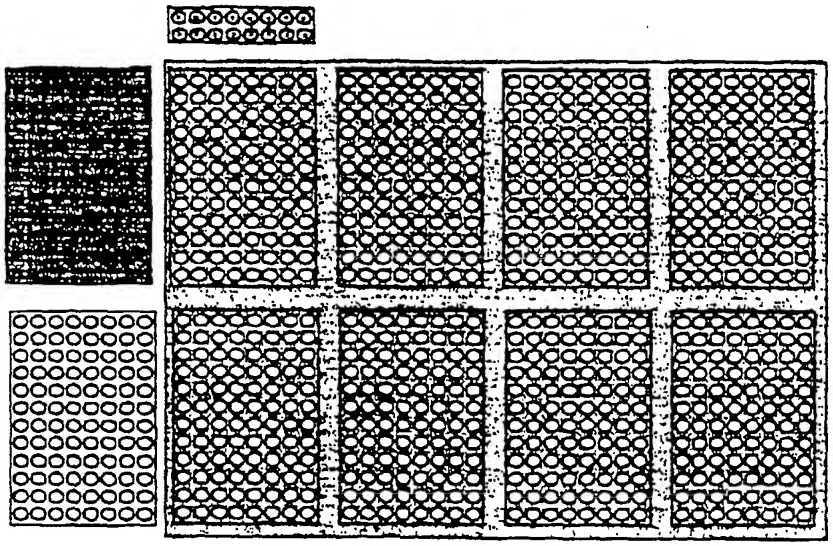


Figure 11

Genewriter Platform Design - High Capacity Mode
8 x 1536 well microassay plates addressed with 16 piezoelectric nanovolume dispense heads; One wash/dry station and one additional plate station. 16 plates evacuated by a single vacuum station.

Capacity of 8 x 1536 = 12,288 oligos/run

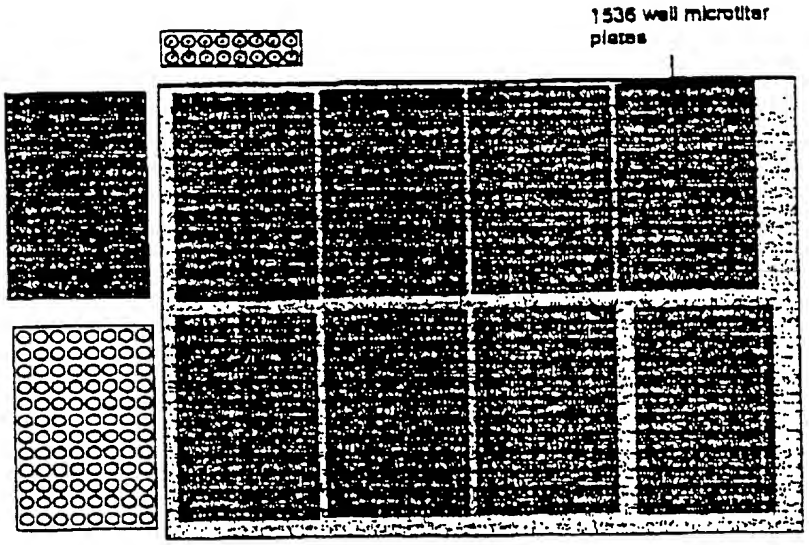


Figure 12

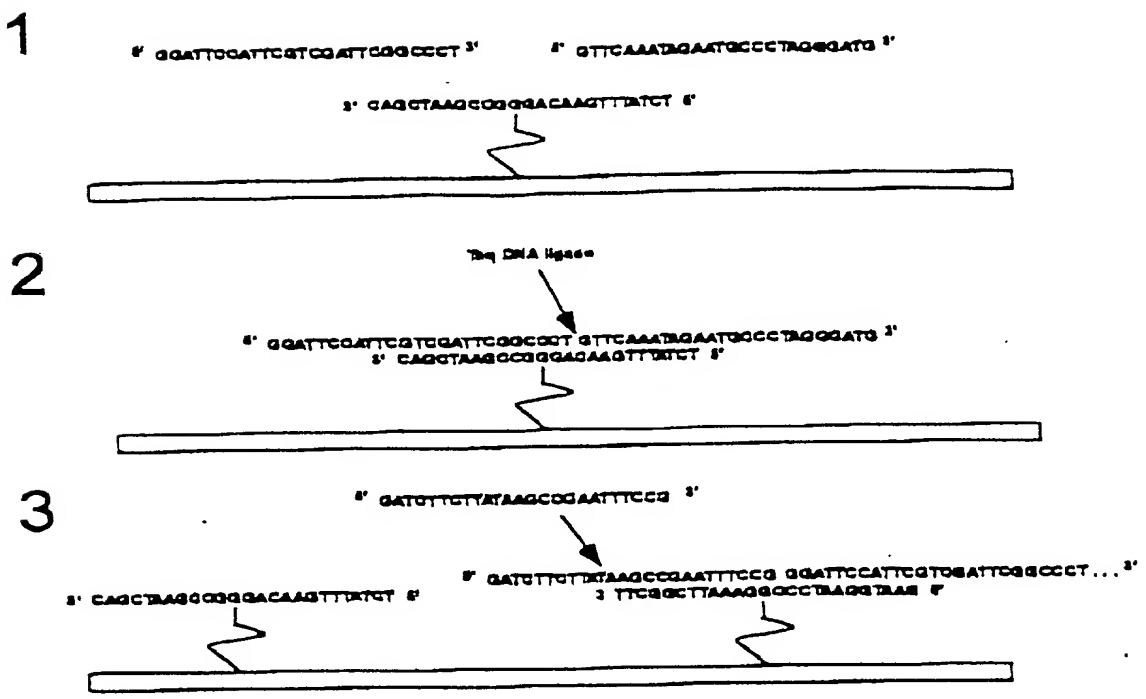


Figure 13

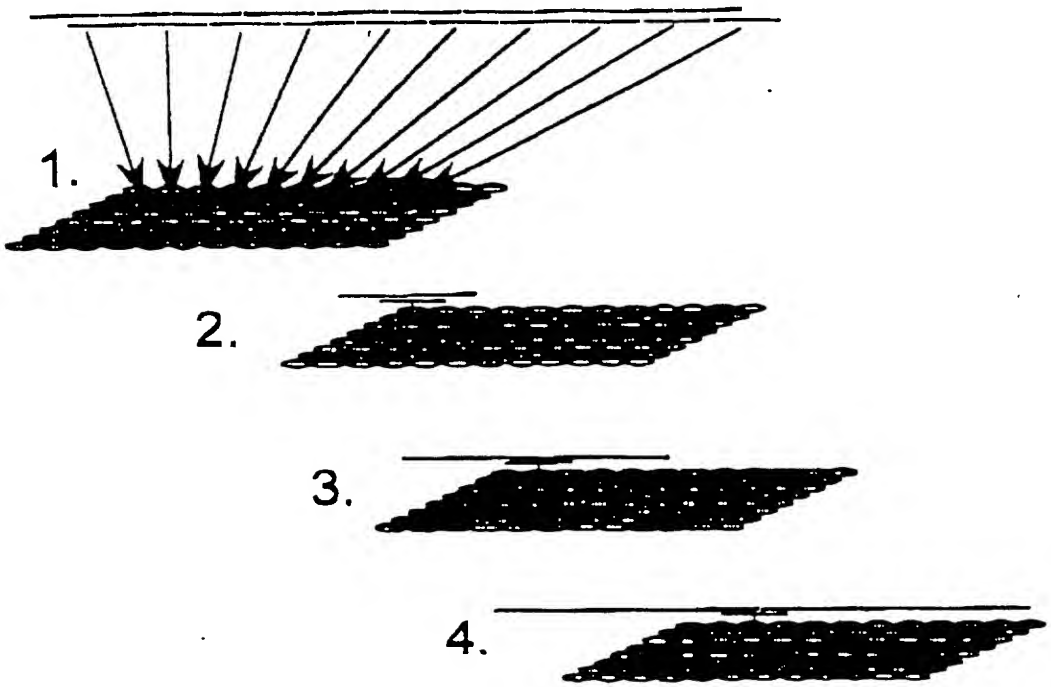
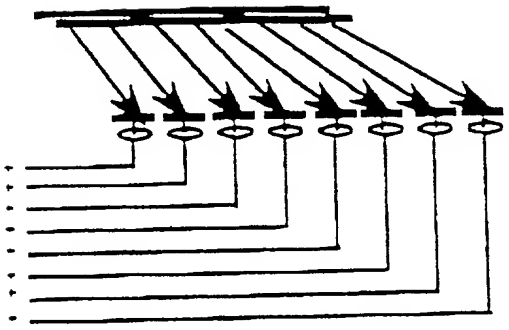
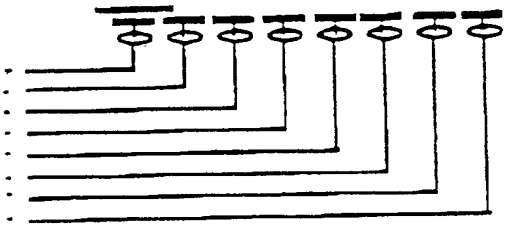


Figure 14

1.



2.



3.

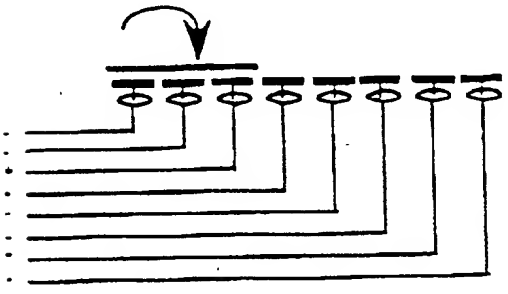


Figure 15

Bidirectional primer extension strategy for gene assembly

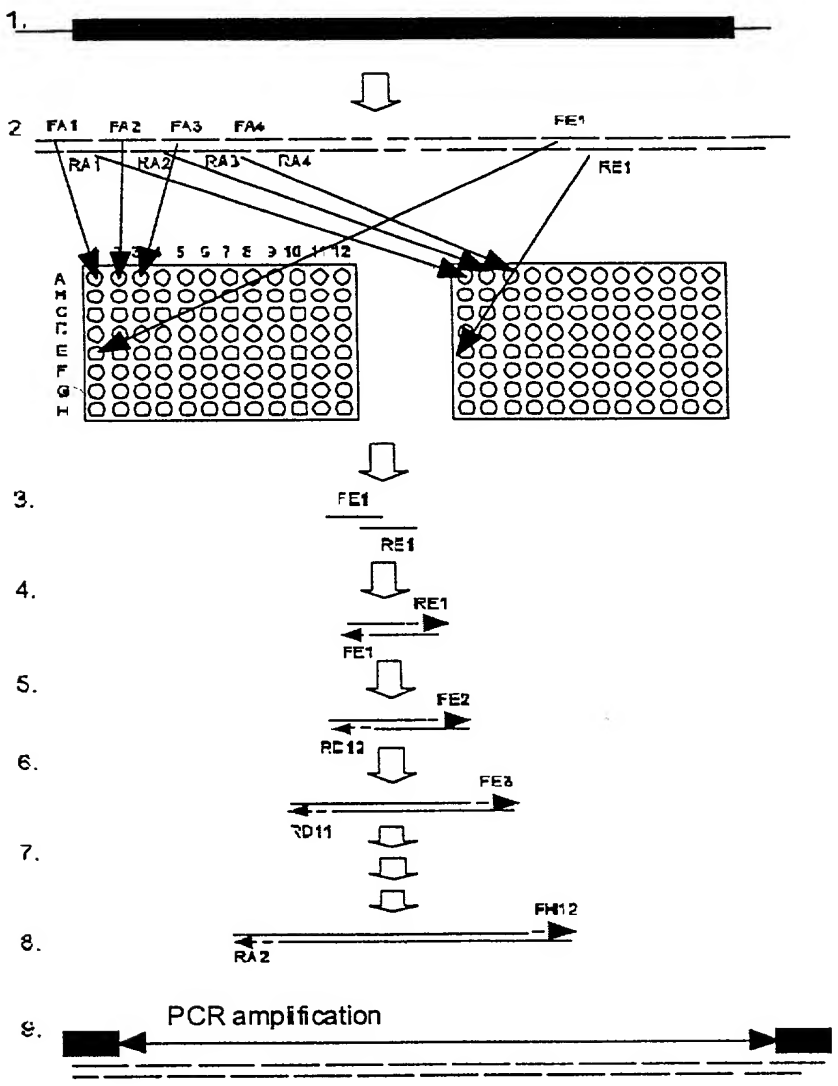


Figure 16

System Diagram for Genewriter

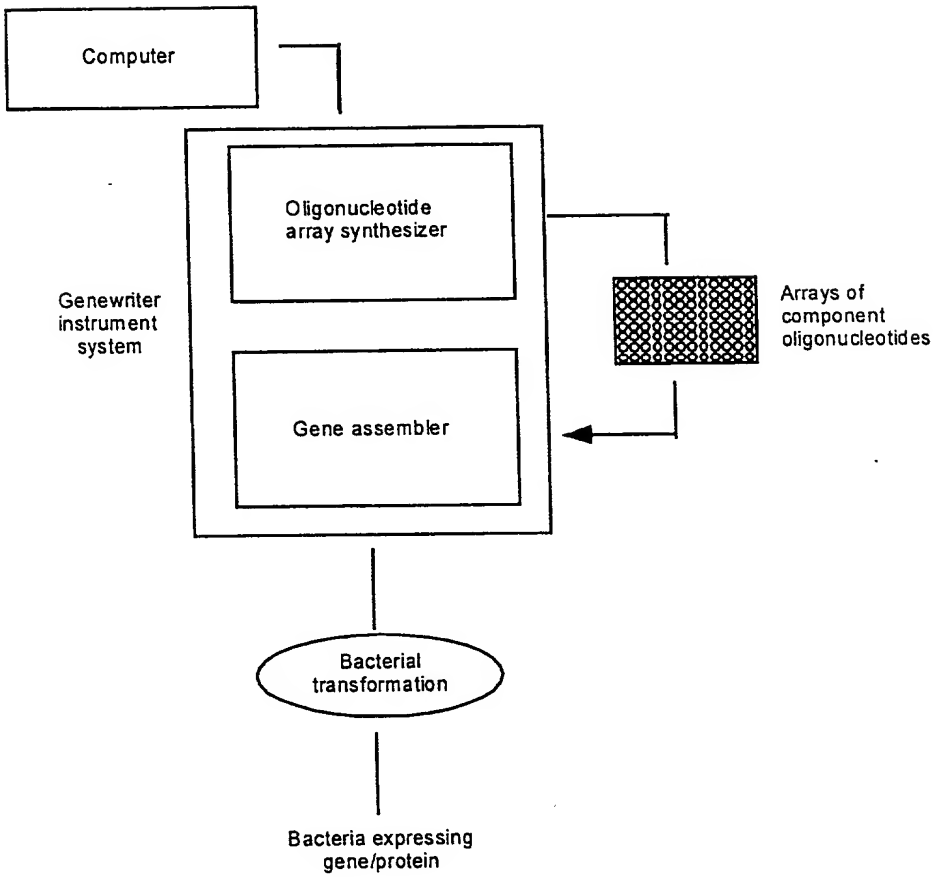


Figure 17

Perspective view of Genewriter Instrument

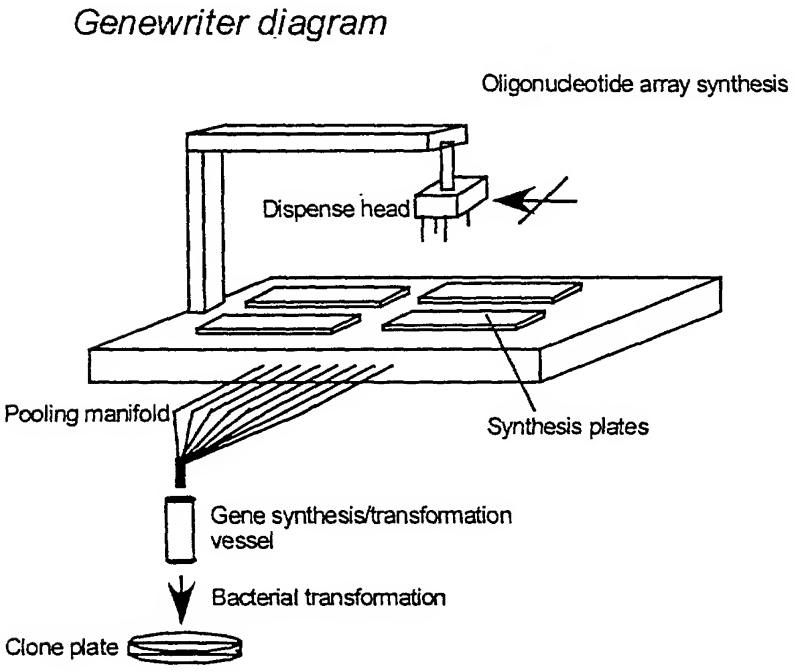


Figure 18